PI5USB2549
PI5USB2549WAE EVB Rev. A User Manual

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1. Introduction

Pericom's PI5USB2549 is the USB dedicated charging port (DCP) controller and current limit switch. The part not only supports the devices that follow Chinese Telecommunication Industry standard UD/T1591-2009 and Battery Charging Specification Rev. 1.2 (BC1.2) but also the non-compliance devices.
PI5USB2549 supports to 2.4A charging mode with MODE_SEL set to "HIGH" (Divider-1A/2A/2.4A scheme), and 2.0A charging mode with MODE_SEL set to "LOW" (Divider-1A/2A scheme).
The PI5USB2549 evaluation board (EVB) is designed to demonstrate the benefits, performance and key features of PI5USB2549. This user manual describes the usage of this EVB and it will be divided into following sections:

- **Overview**
- **Quick start**
- **Details description**
- **Board Design information**
  - **PI5USB2549 EVB Schematic**
  - **PCB Layout**
  - **PCB Layout Requirements**
  - **BOM List**

2. Overview

Figure 1 is the block diagrams of Pericom PI5USB2549 Evaluation board (EVB) and Figures 2a & 2b are the EVB photos. JP3/JP4 on PI5USB2549 EVB is power source header pin which is for external power input. J1 is USB receptacle connector which is used to connect the mobile device.

JP6 is used to control the mode setting of PI5USB2549 for Apple 2.4A or 2.0A charging scheme.
The LED D1 is the charging signal (/STATUS) which will active when the output is connected to the portable device.
The current limit of the board is controlled by RILIM. For details please refer to session 4.

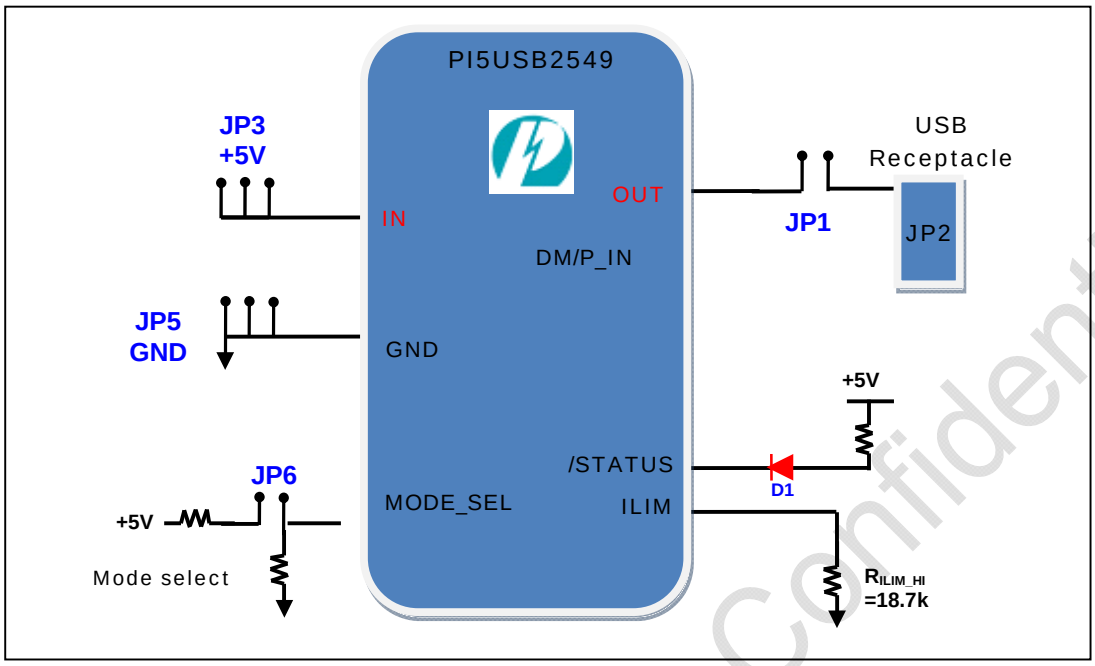


Figure 1, Block diagram of PI5USB2549 EVB

Figure 2a, Front view of PI5USB2549 EVB

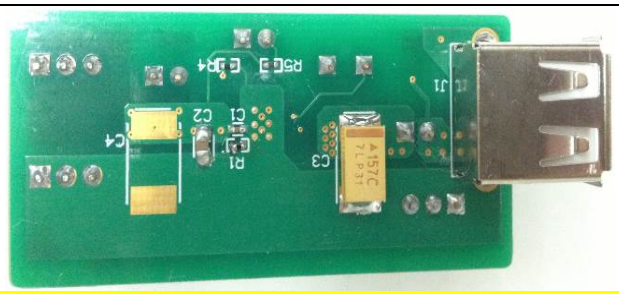


Figure 2b, Bottom view of PI5USB2549 EVB

3. Quick Start

To start-up the PI5USB2549 EVB, complete the following steps:

1. Set the jumper and switch of PI5USB2549 EVB according to the Table 1
2. Connect the EVB between 5V power source and mobile device as Figure 3
3. Power up the EVB with external power supply (+5V connect to JP3, GND connect to JP4)
4. Plug the portable device into EVB USB connector J1

Table 1, Default Header pin on EVB (header pins location refers to Figure 4)

Header pin #	Pin name for PI5USB2549	Header pin status	Remark
JP1	OUT	Short	
JP2	/STATUS	Open	
JP3	+5V	Connect to +5V power supply	
JP4	GND	Connect to the GND of the power supply	
JP6	MODE_SEL	Short to HIGH	Short to “HIGH” 5V Open to “LOW” 0V

** Default setting of PI5USB2549 EVB is support to “Apple 2.4A Charging Mode” (MODE_SEL = “HIGH”).*

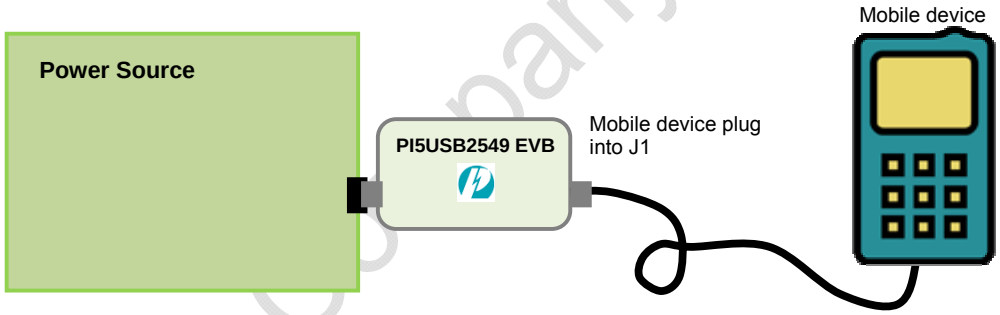


Figure 3, Connection of PI5USB2549 EVB

4. Detail Description

The functionality of header pins are detail described in this section.

Functionality of Header Pins

Table 2, Detail description of the header pins

Header Pin	Pin assigment	Remark
JP1	Pin 1 = Vbus pin of JP1 Pin 2 = OUT of PI5USB2549	Short = Connect the OUT to the USB Receptacle connector (J1)
JP2	Pin 1 = Pin2 /STATUS of PI5USB2549	Open
JP3	IN of PI5USB2549	Need to connect to +5V of external power supply
JP4	GND of PI5USB2549	Need to connect to GND of external power supply
JP5	GND of PI5USB2549	
JP6	Pin 1 = Resister R4 Pin 2 = Resister R5	Short = Resister R5 “HIGH”. Open=Resister R4“LOW”.
TP1	D-	D+ & D- Signal monitoring
TP2	D+	

Current Limit

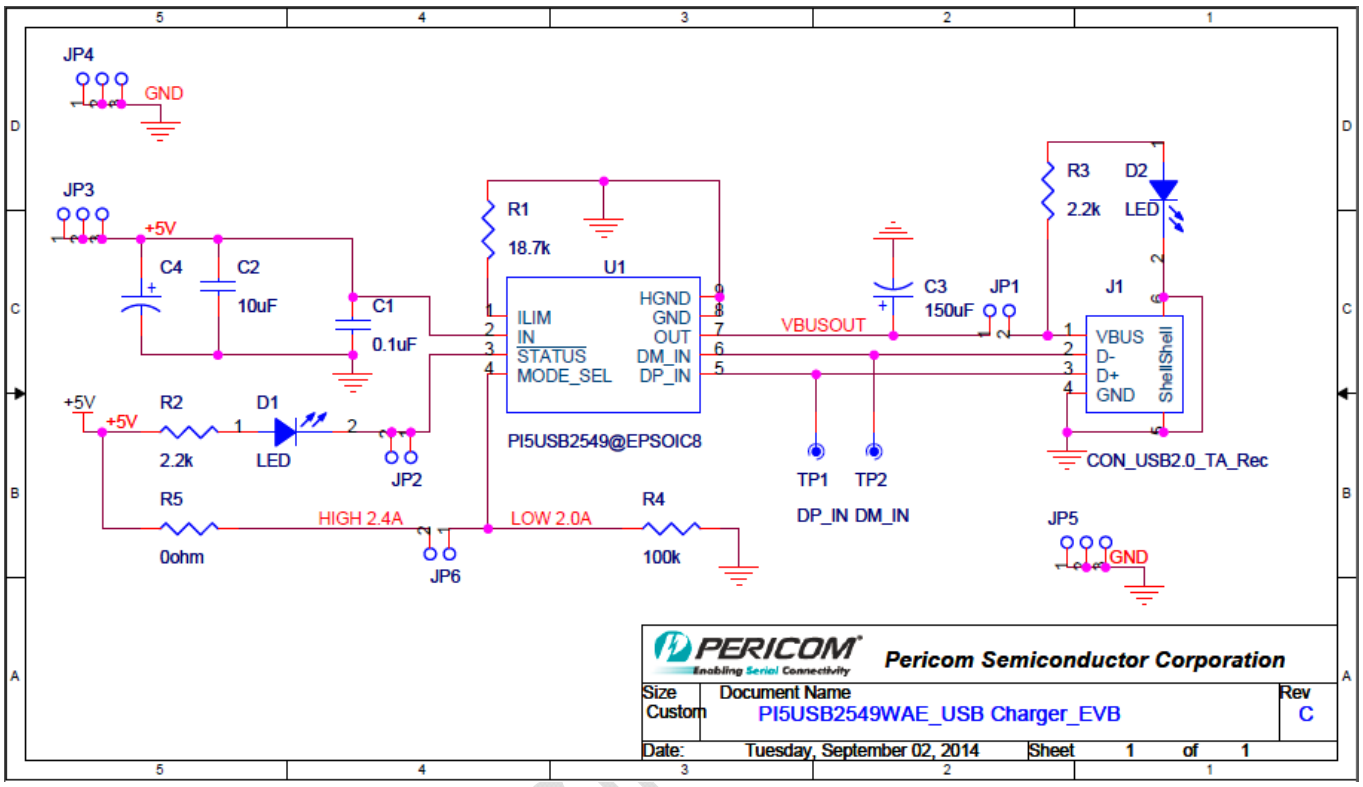
Two current limit values can be set by the external resistor on ILIM_LO (Pin 15 R1) & ILIM_HI (Pin 16 R2)

Table 3, R_{ILIM} Settings

RILIM	Current Limit			Unit
	Min.	Typ.	Max.	
R_{ILIM} = 210kΩ	205	240	275	mA
R_{ILIM} = 80.6kΩ	575	625	680	
R_{ILIM} = 22.1kΩ	2120	2275	2430	
R_{ILIM} = 20kΩ	2340	2510	2685	
R_{ILIM} = 18.7kΩ	2500	2685	2870	
R_{ILIM} = 16.9kΩ	2770	2970	3170	

5. Board Design Information:

PI5USB2549 EVB Schematic



PCB Layout

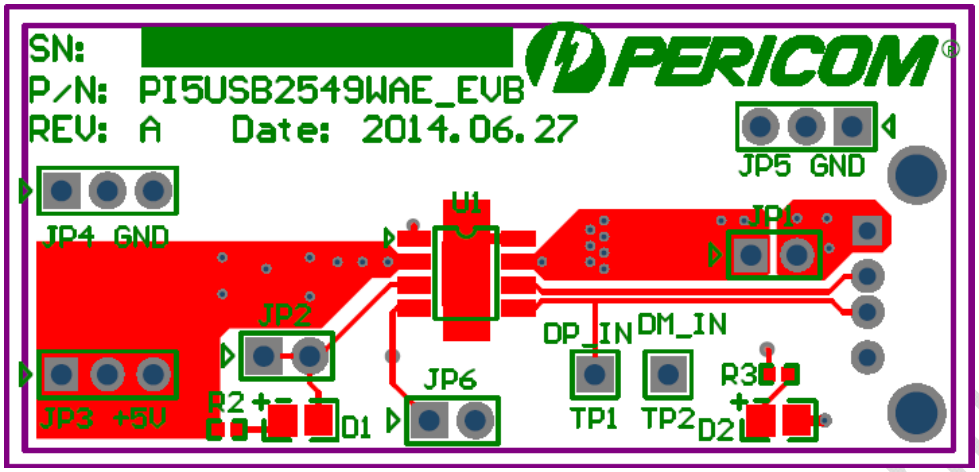


Figure 4, Top view of PI5USB2549 EVB Layout

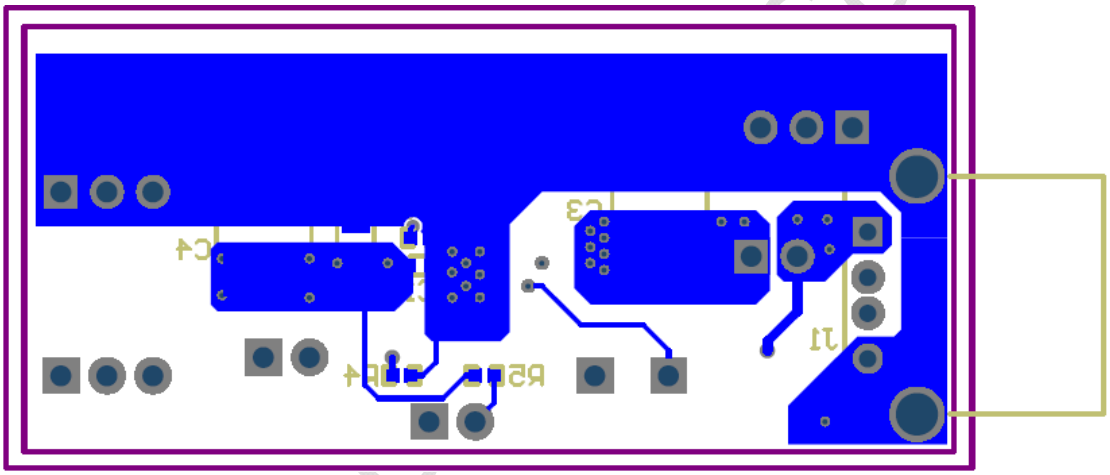


Figure 5, Bottom view of PI5USB2549 EVB Layout

PCB Layout Requirements

a. Stack Up:

Layer #	Plane	Material Type	Thickness (mil)
	Solder Mask		0.6
Layer 1	Signal		1.4
	Core	FR-4 S1141	58
Layer 2	Signal		1.4
	Solder Mask		0.6

b. Layout Guidelines

Place the PI5USB2549 near the USB Port output connector and 150µF OUT pin filter capacitor. Connect the exposed pad to the GND pin and the system ground plane by an array of vias.

Place the input capacitors near the PI5USB2549 IN pin with low-inductance trace.

BOM List

Item	Quantity	Reference	Description
1	1	C1	0.1uF Capacitor
2	1	C2	10uF Capacitor
3	1	C3	150uF Capacitor
4	2	D1, D2	LED
5	1	J1	USB2.0 Receptacle connector
6	3	JP1, JP2, JP6	2 x 1 header pins
7	3	JP3, JP4, JP5	3 x 1 header pins
8	1	R1	18.7kohm Resistor
9	2	R2, R3	2.2kohm Resistor
10	1	R4	100kohm Resistor
11	1	R5	0ohm Resistor
12	2	TP1, TP2	1 x 1 header pin
13	1	U1	PI5USB2549WAE EP-SOP8